

# Urological Issues in Cycling

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## Overview

Traumatic Injuries	Overuse Injuries	Other issues
<ul style="list-style-type: none"><li>• Perineal injuries</li><li>• High-velocity injuries (renal injuries)</li></ul>	<ul style="list-style-type: none"><li>• Pressure-related<ul style="list-style-type: none"><li>- Perineal numbness</li><li>- Erectile dysfunction</li></ul></li><li>• Friction-related<ul style="list-style-type: none"><li>- Chafing</li><li>- Soft tissue lesions</li></ul></li></ul>	<ul style="list-style-type: none"><li>• Effect on PSA</li><li>• Infertility</li><li>• Testicular cancer</li></ul>

**How do we reduce the burden of urological maladies in cyclists?**

## GU traumatic injuries

- Mechanisms:
  - 25% Fall from Bike
  
  - 75% Direct contact with bike
    - Top tube – 47%
    - Saddle – 34%
    - Handlebar – 16%
  
  - 25% Collision

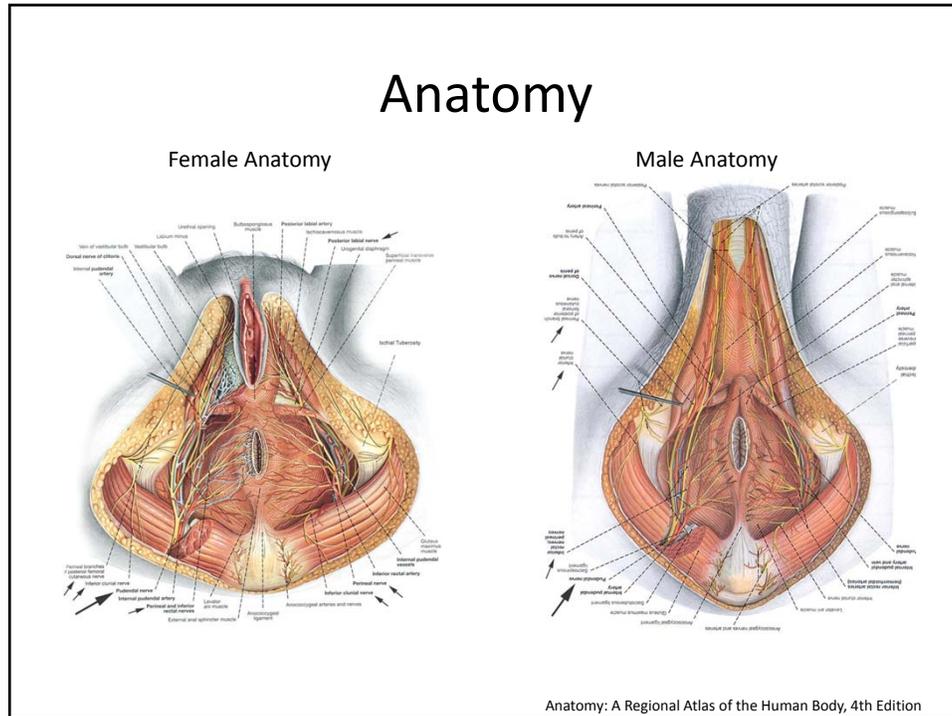
Tasian et al. Inj Prev (2014) 20:350

## GU traumatic injuries

- Kidney – 10%
  
- Urethra – 4%
  
- Female external genitalia – 18%
  
- Male external genitalia – 48%
  - Penis 6%
  - Scrotum/testicle – 42%

Tasian et al. Inj Prev (2014) 20:350

# Anatomy



## Early case report

- 27 year old man rode a 209 km 2 day bicycle race.
- During the race, he developed severe perineal pain and urgency, as well as loss of penile sensation
- For 3 weeks after the race, he was unable to achieve erections
- His symptoms completely resolved after 3 months

## Studies After Long Cycling Events

- Distances: 320 - 820km
- Data measured at various time points
  - Immediately after vs 1 week after
- Parasthesias reported in 11%-31%
- Erectile dysfunction noted in 4%-21%
- Usually resolved within a few months

Weiss et al. Am H Sports Med (1985) 13:187  
 Anderson et al. Acta Neurol Scand (1997) 95:233  
 Dettori et al. J Urol (2004) 172:637

## Epidemiologic studies

Massachusetts Male Aging Study  
 1709 men surveyed in Boston (52% response rate)  
 Ages 40-70  
 113 identified as cyclists

ED rates:  
 11% moderate cyclists (<3 hours per week) → N=90  
 17% in sport cyclists (>3 hours per week) → N =23  
 21% in non-cyclists

	Unadjusted OR (95%CI)	Adjusted OR (95% CI)
<3 hr/wk	0.48 (0.25-0.95)	0.61 (0.30-1.22)
>3 hr/wk	0.82 (0.28-2.42)	1.72 (0.55-5.40)

Marceau et al. Int J Imp Res (2001) 13:298-302

## Bicycle Police Patrol Officers

- N = 42 (5 controls), average age 34 (controls 30): no erectile dysfunction
- Studied parameters:
  - Saddle pressures (N=32)
  - Hormonal analysis
  - IIEF (erectile function score)
  - Rigiscan (N=17)
  - Work/health questionnaire
- 91% with occasional perineal numbness – usually after 2 hours of riding
- IIEF (Questionnaire): no one with erectile dysfunction
- Rigiscan:
  - Sleep time erections: No change in number of erection
  - **Sleep time erection quality: decrease in cyclists**
  - **Amount of sleep time with erection: decreased in cyclists**

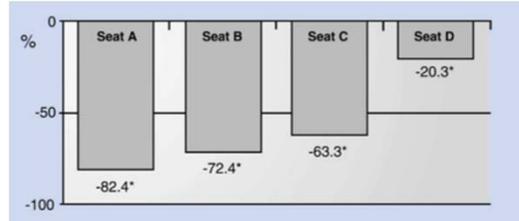
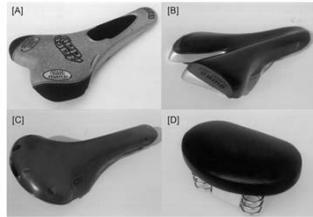
Schrader et al J Androl (2002) 23 :927

## Effect of cycling on penile blood flow

- Measure pO<sub>2</sub> (oxygenation) of penis as a surrogate for blood flow
  - Mean pO<sub>2</sub> was 61 at baseline
  - Mean pO<sub>2</sub> was 19.4 after cycling for 3 minutes
  - Mean pO<sub>2</sub> was 68 after 1 minute of cycling in the standing position.

Nayal et al. BJU International (1999) 83:623

## Effect of saddle



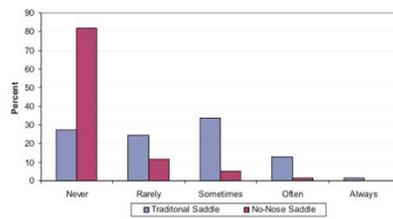
- A. Narrow heavily padded seat
- B. Narrow seat with medium padding and v-shape groove
- C. Wide unpadded leather seat
- D. No nose saddle

Schwartz. Euro Urol (2002) 41: 139-43

## Cutting Off the Nose to Save the Penis

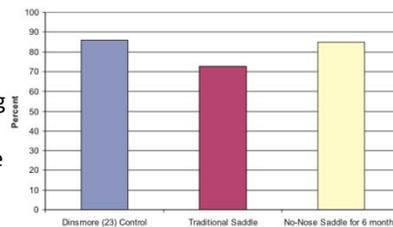
Steven M. Schrader, PhD, Michael J. Breitenstein, BS, and Brian D. Lowe, PhD

Numbness



- 121 men switched to a no-nose saddle
- Less numbness and improved erections after 6 months

% Men getting max sexual function score

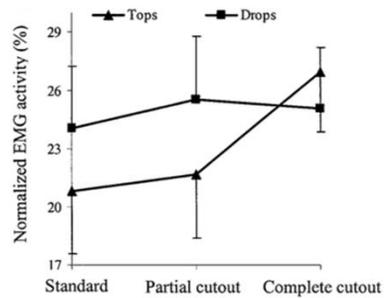


Schrader et al. J Sex Med (2008) 5:1932

## The urologist recommended bicycle saddle



Increase weight on hands



- Ranked as “most comfortable” by less than 20% of participants
- Less stable

Sommer et al. J Sex Med (2010) 2346

Bressel et al. Med Sci Sports Exerc. (2002) 327

## Recommendations?

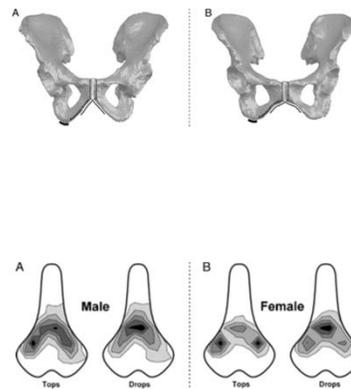
- Consider a recumbent bicycle
- If continuing with a standard bicycle:
  1. Get a good bicycle fit – more upright position gets you onto your ischial tuberosity.
  1. Consider a nose-less bicycle saddle
    - Otherwise wider saddles may be better
  2. Slight downward tilt of saddle
  3. Get out of saddle regularly
  4. Train

## Notably absent from the literature

- Prostatitis
- Urethritis
- Urethral stricture disease
- Effect of microtrauma

## Women-specific issues

- Women have greater changes in anterior force, maximum anterior pressure, and change in posterior center of pressure when switching from the tops to the drops
- Tender to exhibit an anterior “hot spot”



## Impact on Serum Levels of Prostate Specific Antigen

- PSA is a serum protease; its level correlates with both benign and malignant prostate tissue
- The use of PSA testing for the early detection of prostate cancer reduces the risk of prostate cancer death by 22-54%
- For most men cycling has little to no effect on serum PSA
- Those who are more likely to have elevated baseline levels should be advised about the possibility of minor changes
  - Those with prostate cancer
  - Those with known benign prostatic hypertrophy
  - Men >50 years of age

## Cycling and infertility

### 2 small studies

- Study of 12 cyclists compared with runners, triathletes, and sedentary controls.
  - Lower sperm motility was observed in cyclists
- Study of 10 endurance cyclists and 10 voluntary controls
  - No differences in motility, viability and count was observed between the two groups.
  - More abnormal morphology in endurance cyclists

Lucia et al J Appl Physiol (1996) 6:2627

Gebregeziabher Y et al. Int J Sports Med (2004) 25: 247

## Cycling and testicular cancer

Study of testicular cancer in 1982

Case control study with 93 patients with testicular cancer and 90 controls

	Number of cases	Number of controls	Odds ratio	Probability value	95% confidence interval
Cycling (Q1)	44	28	1.99	0.037	(1.04, 3.81)
Horse-riding (Q1)	25	9	3.31	0.006	(1.36, 8.25)
Motorcycling (Q1)	16	15	1.04	0.919	(0.43, 2.41)
Soccer (Q1)	18	16	1.11	0.933	(0.50, 2.50)
Cycling and horse-riding (Q1)	16	5	4.56	0.008	(1.41, 15.65)
Cycling for sport or recreation as a teenager (Q2)	62	49	1.81	0.118	(0.88, 3.75)
Cycling to school as a teenager (Q2)	40	27	1.79	0.090	(0.91, 3.55)
Frequent horse-riding (Q2)	21	11	2.09	0.106	(0.88, 5.08)
Groin injury whilst horse-riding (Q2)	5	0	∞	0.079	(1.116, ∞)

Coldman et al. Br.J. Cancer 1982 46: 749

## Recommendations

### Traumatic Injuries

Tight fitting shorts

General safe riding practices

- Avoid use of EtOH while cycling
- Obey traffic laws
- Lights at night

Improved infrastructure

### Overuse Injuries

Get a good bicycle fit – more upright position gets you onto your ischial tuberosity.

Consider a nose-less bicycle saddles

- Otherwise wider saddles may be better

Slight downward tilt of saddle

Get out of saddle regularly

### Other issues

PSA: unlikely to change due to cycling

Infertility: Effect unclear, semen parameters may be effected by long distance cycling

Testicular cancer: remains a rare disease